

REMARKS

Claims 1, 27, 34, 52, 99 and 100 are amended. Claims 12-15, 43, 97 and 98 are cancelled. Claims 101-129 are added. Claims 1-11, 16-42, 44-54 and 99-129 are in the application for consideration.

The specification is amended for completeness. No new matter is added thereby.

The Examiner's claim objections to claims 12, 13, 15, 34 and 43 are overcome by cancellation or amendment of the subject claims. It is believed that the Examiner also intended to object to the same language in claim 52. Regardless, by such claim cancellations and amendments, no admission is made to the propriety of the Examiner's objections. For example and by way of example only, the Examiner erroneously assumes that Applicant's claim-recited "any layer" is "the dielectric layer". However, there is no reference to "the dielectric layer" in any of the objected to claims.

The objections to claims 27 and 52 are overcome by the amendment requested by the Examiner. Regardless, no admission is made as respects the propriety of the Examiner's objections to original claims 27 and 52.

The objections to claims 97 and 98 are obviated by the cancellation of such claims. Regardless, the undersigned makes no admission as to the propriety of the Examiner's objections to such claims as previously presented.

Claims 27-31 and 52-54 were objected to as being dependent upon a rejected base claim. Such have been rewritten into independent form. In

doing so, the language objected to in claim 34 has been removed in amended claim 52. In light of the Examiner's last action, formal allowance of claims 27-31 and 52-54 is urged.

Independent claim 1 stands rejected as being anticipated by U.S. Patent No. 6,784,478 to Merchant et al. Claim 1 is amended to recite that the treating occurs without depositing any material unto the exposed oxide-containing surface as is clearly supported by Applicant's application as-filed. The Examiner's reliance upon Merchant et al. in rejecting Applicant's previous independent claim 1 is understood to be with respect to the disclosure of forming the Merchant et al. capacitor dielectric layer 32 to be "silane oxide" at col.4, Ins.34+. However, the fabrication of an oxide with silane to form the capacitor dielectric layer inherently deposits material onto the allegedly exposed oxide-containing surface in Merchant et al. Accordingly, Applicant's amended claim 1 recites something which is not disclosed by Merchant et al., and the anticipation rejection thereof should be withdrawn. Action to that end is requested.

Further, it would not be obvious to suggest modification of Merchant et al. in arriving at Applicant's amended claim 1, as the alleged equivalent "treating" in Merchant et al. fundamentally requires a material deposition to form the capacitor dielectric layer, and "treating" without material deposition as recited in Applicant's amended independent claim 1 would defeat the purpose of forming a capacitor dielectric layer in Merchant et al. Accordingly, claim 1 as amended is allowable over Merchant et al.

Applicant's independent claim 34 stands rejected as being obvious over a combination of Merchant et al. as previously applied in view of U.S. Patent No. 6,475,854 to Narwankar et al. Claim 34 has been amended to recite that the treating is void of depositing any material onto the exposed oxide-containing surface. Merchant et al. is inapplicable to this limitation for the reasons argued above. The Narwankar et al. reference does not cure the deficiencies asserted above in this regard. Accordingly, Applicant's amended independent claim 34 recites something which is not found in either of Merchant et al. or Narwankar et al. Therefore, the combination of such references does not include all of the limitations of Applicant's amended claim 34, and the obviousness rejection thereof should be withdrawn. Action to that end is requested.

Withdrawn claims 99 and 100 are amended in an analogous manner to the amendments made to claims 1 and 34, respectively. Language which was objected to in other claims has also been deleted by amendment in claim 100. Upon allowance of claims 1 and 34 as asserted herein, claims 99 and 100 should come back into this application, as such include all of the limitations of an allowed claim to the elected species.

Claims 101-129 are added. Independent claims 103 and 111 recite that the treating deposits a material onto the exposed oxide-containing surface, and that said material is of a thickness of only three monolayers or less. It is believed such added language should not be objected to for reasons which the Examiner previously objected to claims 12, 13, 15, 34

and 43. Independent claims 103 and 111 are seen to be allowable over Merchant et al. and the other references of record. As asserted above, Merchant et al. clearly contemplates significant deposition in its alleged equivalent "treating" as the very capacitor dielectric region of its capacitor is being formed by that which the Examiner finds analogous to Applicant's claimed "treating". It would in no way be obvious to suggest any modification of Merchant et al. to deposit a material of only three monolayers or less as such a layer would be inadequate in thickness to form or function as a capacitor dielectric layer, and thereby defeat a purpose of Merchant et al. in fabricating a capacitor. Accordingly, Applicant's new independent claims 103 and 111 are not obvious over Merchant et al. whether taken alone or in combination with any of the other references of record, and such claims should be allowed. Action to that end is requested.

Added independent claims 101 and 102 are species-linking claims containing the above-asserted limitations in claims 103 and 111, respectively, and are otherwise patterned after withdrawn claims 99 and 100, respectively. Upon allowance of claims 103 and 111, independent claims 101 and 102 should be allowed in this application as such include all of the limitations of an allowed claim to the elected species.

Independent claims 119 and 122 are added. Such are essentially claims 4 and 5, respectively, rewritten into independent form. Original claim 4 (now claim 119) stands rejected as being anticipated by Merchant et al. Applicant disagrees and requests reconsideration.

In summarily rejecting claim 4, the Examiner asserts that Merchant et al. discloses an exposed oxide-containing surface comprising hafnium oxide of its capacitor dielectric 32. Applicant does not disagree. However, there is no disclosure or suggestion of treating such a surface with either a silane or a borane. Rather, Merchant et al. merely discloses forming its capacitor dielectric layer of any one of the various stated materials, one of which includes "silane oxide". A "silane oxide" clearly must predominantly comprise silicon dioxide as the silane is essentially contributing silicon from the silane to the oxide being formed. There is absolutely no disclosure or suggestion whatsoever in Merchant et al. of forming its "hafnium oxide" utilizing silane, and a person of skill in the art would not be led to do so as the inclusion of silane as a deposition precursor in forming hafnium oxide would tend to form silicon oxide as opposed to hafnium oxide, and thereby defeat the purpose of forming hafnium oxide. Accordingly, there is no disclosure or suggestion of treating an exposed hafnium oxide-containing surface of a capacitor dielectric region with at least one of a borane or a silane in Merchant et al. Therefore, independent claim 119 should be allowed, and action to that end is requested.

Original claim 5 (now independent claim 122) stood rejected as being obvious over a combination of Merchant et al. and U.S. Patent No. 5,452,178 to Emesh et al. Merchant et al. is inapplicable to Applicant's independent claim 122 for analogous reasons asserted immediately above with respect to claim 4 (now claim 119). Further, even though Merchant et

al. does not disclose aluminum oxide formation, it further does not disclose nor would it be suggested to employ silane in the formation of aluminum oxide as such would defeat the purpose of forming a predominant aluminum oxide layer, as the silane would contribute silicon in forming a silicon dioxide. The cited Emesh et al. does not overcome this deficiency. Accordingly, Applicant's independent claim 122 should be allowed, and action to that end is requested.

Added claims 125-129 recite that the subject treating is with at least one borane and with at least one silane. Support for the same can be found in Applicant's specification at line 3 of § [0020]. None of the references can remotely be considered as suggesting treating with both.

Applicant's dependent claims should be allowed as depending from allowable base claims, and for their own recited features which are neither shown nor suggested in the cited art. Action to that end is requested.

An earnest attempt has been made to place this application into immediate condition for allowance.

Respectfully submitted,

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